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Overhead Distribution, Compilation and Presentation

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OVERHEAD DISTRIBUTION, COMPILATION AND PRESENTATION

OVERHEAD DISTRIBUTION

1. Recording Expense Items

Purchases, i. e. the incurring of expenses (overhead) are originally recorded in the Voucher Register or other book of original entry similar in nature. This is the first step in the distribution of expense.

The accounting treatment of expense items is a feature of cost accounting that has presented perplexing difficulties and has caused serious errors. Expenses, however, can be accurately calculated and controlled through an account captioned "Expense Ledger" which controls the Expense Debit Slips as explained below. Examples of expenses are wages and materials used in connection with repairs made inside the shop by outsiders; and the cost of repair parts for machinery and equipment bought as substitutes for broken or scrapped parts. When an expense item has been properly approved, a voucher is prepared from the invoice which covers it. This voucher is then recorded in the Expense Ledger Column (a debit column) of the Voucher Register or Purchase Journal and in the Vouchers Payable column. The former column may have two subdivisions, namely, (1) code and (2) amount. By "code" is meant the standing expense order which is chargeable with the individual expense item. This order number is of course obtained from the firm's code of standing orders. The use of a numerical code is preferable because it is the only one that can be used in the operation of the battery or outfit of electric machines such as the Hollerith or Powers.

The Expense Ledger account in the general ledger may be charged from a summary journal entry which distributes the data in the Voucher Register. As soon as the bookkeeper in the general accounting office enters each voucher covering expenses in the Voucher Register, he fills out an Expense Debit Slip. A sample Expense Debit Slip appears below. It shows the date filled out, the standing expense order to be charged, an accurate description of the charge so that the invoice covering the purchase need not be referred to in order to identify the charge, the number of the voucher payable from which the charge was taken, the amount of the charge and the initials of the person who issued the slip.[1]

[1]The writer has received valuable suggestions from Mr. J. P. Jordan, with respect to the subject matter of this article.

EXPENSE DEBIT SLIP

Date .....

Charge .....

Description of charge.....

.....

.....

.....

Date of Invoice.....

Voucher Payable No. .....

Issued by ..... Amount .....

All expense debit slips should be checked against entries made in the Expense Ledger column in the Voucher Register with which they should exactly agree. The Expense Debit Slip has the same function with respect to the requisition of expense items as the material requisition has with respect to the consumption of purchases like raw materials. After each Expense Debit Slip is filled out it is forwarded at once to the cost department where it is filed back of the standing expense order to which it is chargeable. Back of such orders also certain material requisitions and time tickets (cards) are filed.

It is seldom necessary to reverse a charge made to a standing expense order through the medium of an expense debit slip. One example, however, would be in the return of excess materials to the seller which were bought for special repairs. In such a case the Expense Debit Slip may have stamped or written on it in red the word "Credit." Such cases do not occur often enough to warrant the preparation of a special form to be called "Expense Credit Slip."

When summarizations or accumulations are being made at the end of the month for monthly journal entries, the grand total of expense debit slips chargeable to standing expense orders in Burden and Expense Statements is credited to the Expense Ledger account in the general ledger. This must equal the amount already

charged to the Expense Ledger account by means of the monthly journal entry which distributes the data from the Voucher Register.

A less accurate method of handling expenses and one which involves more clerical labor is known as the "stock record" method. Under the latter method, purchases of certain expenses are entered on receiving reports and posted to stock record sheets or cards. Frequently, however, the consumption of these expense items is not recorded on the stock record sheets by means of requisitions. As a result, the book inventory is overstated. This condition is not detected until a physical stock taking discloses the presence in the book inventory of expense items which have already been consumed. An adjustment must then be made. A very common illustration of this condition is found in the handling of repair parts.

This error of overstatement of the book inventory can be avoided, and at the same time the clerical labor which would be involved in clearing the stock record sheets by requisition can be obviated by recording expenses through the medium of the Expense Debit Slips as previously described. Under the latter method, repair parts, for example, should be entered on receiving reports filled out in the receiving room but neither the parts nor the records are transferred to storerooms. As a result, the parts are not recorded in the "received" columns of stock ledger sheets or stock cards, and hence are not charged to any controlling material inventory account. Instead, the repair parts should be sent from the receiving room directly to the department which is responsible for them. Repair parts thus are often called "non-receivable" items because they are not received in the storerooms.

2. Bases of Distribution

Before overhead can be distributed, compiled, and presented, the bases for its distribution must be selected.[1] In practice it is impracticable to distribute all overhead on one common basis, however desirable that might be from a bookkeeping point of view. This follows because the distribution should approximate the facts as far as possible in each case; and all items of overhead do not vary with the same factors. For example, rent chargeable to a department would not fluctuate with the volume of production; whereas power and some other overhead items do. For each item of overhead a basis must be selected which for all circumstances must be the most equitable. The selection of such a basis is frequently difficult. In the following paragraph certain bases of distribution are discussed.

[1] It is suggested that the reader review the steps involved in the calculation and application of departmental burden rates proposed in Volume 1, No. 3, of the Official Publications.

3. Division Expenses

In every properly organized industry there is a functional separation of activities into (1) manufacturing, (2) selling, and (3) general administration. The portion of the plant and organization employed in carrying on each of these major activities is known as a division. Within each division there is a further separation of work into departments. There are certain expenses in an organization which apply to the manufacturing division as a whole and not to any specific department, although division expenses ~~like the other "apportioned expenses" that appear in the Foundry Melting Cost Statement, for example (shown on page 9)~~ must be distributed to direct (productive) departments according to the total direct and indirect labor costs of each direct (productive) department. Some division expenses are the following:—

1. Superintendence.
2. Office Salaries.
3. Receiving and Raw Material Store Expense.
4. Shipping and Finished Material Stores Expense.
5. Watchman.
6. Experimental Expense.
7. Maintenance of Office Equipment.
8. Maintenance of Building.
9. Maintenance of Patterns.

With the possible exception of Superintendence the names of the above accounts indicate the nature of entries therein. Superintendence account should be charged only with divisional supervision and not with departmental supervision. Superintendence charges which include the salaries of the works manager, the general superintendent, and assistant superintendent, cannot be charged directly to productive departments. This is an item of division expense which can be distributed to departments on the basis of total payrolls in each.

4. Department Heads and Foremen

If a department head or foreman works only in one department, his salary can be directly charged to that department. But if he works in several departments, his salary must be distributed to those departments according to the benefits derived from his efforts. This distribution may be on the basis of total payroll or number of workers in each department; or on the basis of the relative amounts of time spent in the different departments, if time records are kept for the foreman's activities.

5. Rent

Rent, or according to the practice of many accountants, items in lieu of rent such as real estate taxes and mortgage interest, are usually regarded as "fixed overhead" charges because they do not vary with changes in the volume of production. They are prorated to departments according to square feet of effective space occupied. In some concerns, a uniform charge per square foot is made for all departments. In others, the rent charge depends on the location of the department. For example, in a department store, the departments located on the main aisles are charged with more rent than those on side aisles; and the departments on the lower floors are charged with more rent than those on the upper.

For rent charges, schedules or distribution sheets are prepared which show the relative spaces used by each department; and the rent chargeable to each. These schedules serve as the basis for monthly journal entries which distribute the "fixed overhead" items. As conditions change, schedules should be changed accordingly.

6. Taxes

Taxes on real estate and other property necessary for manufacturing, if they are not treated as the equivalent of rent, may be apportioned to departments in the ratio of assessed values in each department to the total values in all departments. In many cases book values are used as a basis. Income, excess profits, capital stock, and franchise taxes should not appear as burden charges in the Profit and Loss Statement. Instead, they should be deducted from the undivided profits as financial (not manufacturing) charges.

7. Insurance—Fire, Group Life and Liability

Fire insurance premiums are prorated to departments according to the value of buildings, machinery, equipment, stock and product insured in each department.

Group life insurance premiums are distributed to departments on the basis of the number of workers insured in each department.

Liability insurance premiums are apportioned to each department after transfers of labor charges between departments have been made. The apportionment is made on the basis of total payrolls in each department.

8. Purchasing, Cost, Payroll, and Statistical Department Charges

The salaries of employees in the purchasing, cost, payroll and statistical departments should be charged to the respective departments in which they are engaged. In some cases, however, certain employees work in more than one department. In such cases their

salaries should be apportioned according to relative amounts of time spent in each department, or the total charges of each department may be distributed over the divisions and productive departments on the basis of total payrolls.

9. Heat, Light, and Power

Heat is distributed according to the ratio of square or cubic feet in each department heated.

Light is prorated according to the wattage of lamps used in each department.

Power is apportioned according to the consumption of horsepower by the motors installed in each department. If, however, meters are used in departments the kilowatt-hour (K. W. H.) consumption of each department can be measured readily.

If great difficulty is experienced in separating heat, light and power items, they should be combined in one account. In this case distribution can be made on the basis of kilowatt hours of electric current consumed by each department if meters are maintained; on the basis of pounds of steam used; or simply on an arbitrary basis such as floor area.

Overhead Compilation

10. General Nature of Expense and Burden Statements

Certain costs (i. e., items other than prime costs), like trucking, engineering, compressed air, steam, electric power, heat, light, liability insurance, taxes, division, and general expense, are collected and accumulated in expense statements to be taken care of by journal entries during each month. These are distributed to the departmental burden statements of direct (productive) departments which should bear their share of the apportioned expenses. The basis of distribution varies. Some of these bases have been discussed. These departmental burden statements are charged also with burden labor and maintenance and supplies consumed in the department as shown by time tickets, material requisitions, and expense debit slips which are filed daily back of standing expense orders and are summarized for each order before burden statements are prepared.

The total burden of each department is applied to the product passing through it on individual part cost sheets and assembly cost sheets during the period, through the medium of departmental burden rates as explained in Volume 1, No. 3, of the Official Publications.

MELTING COST

Date.....

Standing Order		Labor[1]	Req. and Expense Slips	Total
104	Cupola loaders and tenders	$296.40	.....	$296.40
106	Breaking scrap	30.00	.....	30.00
109	Melting material stores labor	200.00	.....	200.00
111	General labor	2.00	.....	2.00
	TOTAL	$528.40	.....	$528.40

MAINTENANCE AND SUPPLIES

124	Repairs to elevators	$32.00	$1.00	$33.00
143	Clay	.....	3.00	3.00
144	Coke	.....	280.00	280.00
146	Fuel oil	.....	20.00	20.00
148	Limestone	.....	3.00	3.00
149	Lining material	.....	10.00	10.00
150	Sand	.....	4.40	4.40
151	Miscellaneous supplies	.....	.....	.....
	TOTAL	$32.00	$321.40	$353.40

APPORTIONED EXPENSES

Power and light	$200.00
Compressed air	60.00
Liability insurance	10.00
Depreciation	120.00
Taxes	30.00
General expense	350.00
TOTAL	$770.00
TOTAL CONVERSION COST	$1651.80

METAL COST

Pig iron	300,000	$0.017	$4800.00	$4800.00
Purchased iron scrap	150,000	.009	1350.00	1350.00
Purchased steel scrap	4,000	.008	32.00	32.00
Scrap out of shop	160,000	.009	1440.00	1440.00
TOTAL	614,000	.....	$7622.00	$7622.00
TOTAL MELTING COST	.....	$560.40	$7943.40	$9273.80
To work in process	590,000	.017	.....	10,030.00
Balance for month (to Profit and Loss)	.....	.....	.....	756.20
TOTAL				$9273.80

[1] The figures in this statement are hypothetical.

11. Foundry Melting Cost Statement

The metal cost of castings made in a foundry is shown monthly in a Melting Cost Statement which is credited with the actual amount of metal poured at the predetermined (estimated) rate. Any difference between the actual figures and predetermined figures for the month is adjusted through the Profit and Loss account. The costs entered in the Melting Cost Statement shown on page 9,[1] which also shows other costs beside burden, arise from a variety of sources, namely:

1. Time Tickets
2. Material Requisitions
3. Expense Debit Slips
4. Monthly Journal Entries

Time tickets (cards), material requisitions, and expense debit slips are filed with the standing expense orders to which they are chargeable. The code of expense orders for the Melting Department is shown in the first column. The Melting Cost Statement shows, first, all of the actual melting cost during the month and second, the "applied" melting cost figured in accordance with the predetermined melting rate. The actual melting cost is divided into two big classes: (1) conversion cost and (2) metal cost. The items in the first two money columns are cross totaled to give the figures for the Total column. The "Apportioned Expenses" are posted to the Melting Cost Statement from monthly distribution journal entries. The sum of the figures in the total column of the first three sections of the statement gives the "Total Conversion Cost." Then the Metal Cost is calculated and added to the Total Conversion Cost to give the Total Melting Cost. The number of pounds of metal melted for the period (590,000) multiplied by the predetermined melting rate (.017) gives the figure of applied melting cost ($10,030.00). The difference between applied melting cost and total melting cost incurred, equals the amount to be transferred to Profit and Loss ($756.20). Melting Cost is prorated on the basis of cost per pound of metal poured.

12. Work in Process Burden

Burden applied by the use of departmental burden rates is charged to Work in Process Burden accounts and credited to Departmental Burden Credit accounts.[2] The former are the controlling accounts for work in process burden. Any balances which lie in these accounts at the end of the current period are entered on an Inventory Statement which shows not only Work in Process Burden accounts but also Work in Process Labor, Work in Process Material, and Raw Material.

[1] This form is taken from the Standard Cost System of the American Foundrymen's Association.

[2] In some cases applied burden is debited to Work in Process accounts which show also direct material and direct labor costs.

C. P. A. CORPORATION

C. P. A. CORPORATION
INVENTORY STATEMENT
December ~~January~~ 31, ~~1920.~~ 1919

	Dec. 31, 1918	Nov. 30, 1919 (1)	Dec. 31, 1919	Inc. or Dec. of Current Mn. Over Preceding Mn. (2)	Inc. or Dec. of Current Mn. Over End of Previous Yr.
Raw Material Accounts					
A					
B					
C					
Total Raw Material Accounts					
Work in Process Accounts					
D—Direct Labor					
E—Direct Labor					
F—Direct Labor					
Total Work in Process Direct Labor					
G—Direct Material					
H—Direct Material					
I —Direct Material					
Total Work in Process Direct Material					
J—Burden					
K—Burden					
L—Burden					
Total Work in Process Burden					
Grand Total Work in Process					

1 The amount in this column is always the figure at the end of the month which precedes the current month.
2 Increases are entered in red; decreases in black.

By reference to the sample Inventory Statement shown on page 11, it will be noted that it shows the balances of the above inventory accounts at the end of the current month, the last month, and the end of the previous year. The increase or decrease of the current month over the last month and the end of the previous year is also shown. By reference to the Inventory Statement the management can tell whether or not production is increasing too rapidly for the sales department, and whether or not obsolete and "factory worn" inventories are piling up. Accumulation of stock which becomes factory worn is just as expensive for a manufacturing enterprise as accumulation of "shop worn" stock is for a merchandising establishment.

13. Entries for Burden on Cost Sheets

The method of making detail entries for applied burden on cost sheets may be briefly explained. The following is the arrangement of the burden section of a cost sheet used in a job-cost system to record the costs of an individual part which enters a sub-assembly or a major assembly.

BURDEN

Hours	Burden Rate	Amount	Unit Burden Cost	
			Operation	Total

Assume that the basis for the application of departmental burden rates is direct (productive) labor hours. The number of direct-labor hours that an individual job consumes in each operation is entered in the "Hours" column. The burden rate for each operation is entered in the "Burden Rate" column. The hours times the burden rate equals the burden chargeable to the job

while passing through the operation and this is recorded in the "Amount" column. The burden cost of the first operation is divided by the number of good and defective pieces made on the order during that operation and the result is entered in the "Operation" column. The unit burden cost for the second operation is calculated in a similar way and is added to the unit burden cost of the first operation. The sum is entered in the "Total" column which accumulates the burden cost by operations. In other words, the "Total" column is a running total or accumulation column.

14. Overhead Adjustment Accounts of Cover Paper Manufacturers

A rather unusual method of adjusting the differences between actual overhead and applied overhead is followed by cover paper manufacturers who have adopted the uniform cost system devised for that industry. The method can be illustrated by reference to the following accounts: (1) Departmental Burden account, (2) the Overearned and Unearned Burden account, and (3) the Burden Variance account. The departmental burden account selected for the illustration is the one kept for the Material Preparation Department which prepares material before it is used in the processes. This account is debited with fixed charges on the department's equipment; with its share of building expense, which is based on the square feet or the cubic feet of effective space in the department, with its share of supplies, indirect labor and service department charges, such as heat, light and power.

The material preparation burden cost ($1,970) estimated for the period is entered next to the account title of the burden account (see illustration below) at the beginning of the period. The difference between the period estimate ($1,970) and the applied burden ($2,000) is $30, which is charged to the Material Preparation Burden account because (according to the theory under discussion) the $30 has been "Overearned." This amount is credited to an Overearned and Unearned Burden account. If the period estimate is in excess of the applied burden, the difference is "underearned" and is debited to the Overearned and Unearned Burden account. Any difference now existing between the two sides of the Material Preparation Burden account is known as burden variance and is closed into a Burden Variance account.

All overearned and underearned burden amounts, i. e., the differences between burden estimates and actual operating credits calculated for each departmental burden account, are closed into an Overearned and Unearned Burden account as indicated below. The balance of the latter account is closed into the current profit and loss statement. After this adjustment, any balance then remaining in the departmental burden account is closed into Burden Variance account. Any balance in the Burden Variance account at the end of the period is closed into the current Profit and Loss account.

Period Estimate $1,970

MATERIAL PREPARATION BURDEN

Fixed Charges	60	00	Prepared Material (7000 Hrs.)	2000	00
Building Expense	340	00	Burden Variance	100	00
Supplies	20	00			
Indirect Labor	150	00			
Service Department	1500	00			
Overearned Burden	30	00			
	2100	00		2100	00

OVEREARNED AND UNEARNED BURDEN

Conversion Burden[1]	400	00	Material Preparation Burden	30	00
Finishing Burden[1]	200	00	Profit and Loss	570	00
	600	00		600	00

BURDEN VARIANCE

Material Preparation Burden	100	00	Conversion Burden	200	00
Profit and Loss	190	00	Finishing Burden	90	00
	290	00		290	00

[1] Besides a material preparation department, a cover paper manufacturing concern has two other chief departments, namely, a conversion department and a finishing department.

15. Chief Value of Costs

The chief value of costs is to serve as a guide for the most intelligent management and administration of an enterprise. This statement is not to be regarded as a disparagement of other important uses of costs such as the fixing of proper selling prices and the preparation of financial statements. Costs recorded and summarized in reports with sufficient detail furnish the information for *controlling* costs at their *source*. Cost reduction, therefore, cannot be accomplished without accurate costs which are compiled in reports which make possible intelligent analysis and comparison. Large economies can thus be effected. Control of material and labor through a system of cost reports is easier than the control of burden because prime costs are more easily ascertained, but burden costs should be determined as far as practicable.

The system of reports in a plant will vary with the size and nature of the business, with the type of organization, and with the degree of detail required. In general, however, reports may be classified as follows:

1. Material Reports
2. Labor Reports
3. Burden Reports

16. Use of Burden Statements

This article has to do only with Burden Reports, which are probably the most important in any factory. These are prepared monthly. They should show enough detail to enable the executives, the general manager, the superintendent, and the foreman to determine how the company's money is being spent for burden.

The efficiency of each productive department with respect to its burden can be measured by reference to the table or block of comparative figures at the bottom of burden statements,[1] which show the burden cost per productive hour (if that is the burden basis), and the average burden cost per productive hour calculated by means of carrying forward the burden in running total columns. By a comparison of standard rates with average rates (also shown in the table) decisions can be reached as to whether predetermined rates should be changed.

"Pitiless publicity" of burden statements should be the rule in the plant. Each foreman of a productive department should be furnished with the burden statement for his department every month. He should be made to feel the keen interest of a live participant in the industrial game being played in his plant. He should be given full knowledge of costs and every incentive to reduce them, but he should not be held responsible for costs over which he has no control. By reference to the sample burden

[1]See Volume 1, No. 3, of the Official Publications.

statement in the preceding Official Publication, it will be noted that the burden was divided into three classes: (1) burden labor, (2) maintenance and supplies, and (3) proportioned charges. The foreman's efficiency should be measured by the first two classes only. He is not in a position to control the latter class.

The writer has in mind one foreman in a large factory who felt that he was not responsible for workers loaned to his department. One day some laborers from another department were repairing a core mill in his department. They had been "soldiering" on the job. The industrial engineer employed by the company called the foreman's attention to the fact and told him that the labor and material costs incident to the repairs were to be charged to his department. This was a revelation to the foreman, who was very zealous thereafter in watching his own workers as well as the workers loaned to him.

High burden, however, may be due to the management and not to lax supervision on the part of the foreman. For example, requests for certain machine tools and other labor saving devices may be denied the foreman who requests them. Neither the foreman nor his workers are to blame for excessive burden in such cases. The fault in this case lies at the top of the organization and not at the bottom. Responsibility for it can be placed only with an adequate system of reports.

17. Plant Burden Balances Statement

After departmental burden accounts have been charged with actual burden incurred during a current period, and departmental burden credit accounts have been credited with burden applied by means of departmental burden rates, the data in both classes of accounts are transferred to Departmental Burden Statements—one statement being kept for each direct (productive) department. The actual burden incurred as shown on the burden statement will seldom agree with the applied burden. If the latter is greater than the former, the difference is regarded as a profit. In the reverse case the difference is treated as a loss. The former case shows that burden has been overapplied since the burden rate is too high; the latter case shows that burden has been underapplied since the rate is too low. The resulting differences between actual and applied burden are known as unabsorbed burden balances or plant burden (expense) balances. The unabsorbed balance for each direct (productive) department which appears in its burden statement is transferred to a Plant Burden Balances Statement (see form on page 18), which is a summary statement that shows the unabsorbed burden for each direct department in every division of the organization. Under this method no ledger accounts are opened for plant burden balances. The net result of the foregoing statement is added or subtracted from gross profit in the

THE C. P. A. CORPORATION
PLANT BURDEN BALANCES
January, 1920

	Total To Date	Jan., 1920	Dec., 1919	Profit[1]	
				Increase	Decrease
Unabsorbed Burden Balances					
A. Brown—Division 1—Dept. 1	00000.00	00000.00	00000.00		000.00
" " " " " 2	00000.00	00000.00	00000.00		000.00
" " " " " 3	00000.00	00000.00	00000.00		000.00
" " " " " 4	00000.00	00000.00	00000.00	000.00	
" " " " " 5	00000.00	00000.00	00000.00		000.00
" " " " " 6	00000.00	00000.00	00000.00	000.00	
" " " " " 7	00000.00	00000.00	00000.00		000.00
Total A. Brown	00000.00	00000.00	00000.00	000.00	
B. Smith—Division 2—Dept. 1	0000.00	0000.00	0000.00	00.00	
" " " " " 2	0000.00	0000.00	0000.00		00.00
" " " " " 3	0000.00	0000.00	0000.00	00.00	
" " " " " 4	0000.00	0000.00	0000.00		00.00
Total B. Smith	0000.00	0000.00	0000.00		00.00
Grand Total Plant Burden Balances	00000.00	00000.00	00000.00	000.00	

[1] Profits are entered in "red" and losses in "black."

Profit and Loss Statement, depending on whether the net result is a profit or loss, before the net manufacturing profit is calculated.

18. Comparison of Monthly Burdens

Analysis and comparison are the "Siamese Twins" of management. Intelligent analysis and comparison is impossible without burden statements drawn up in comparative form. An example of a statement which includes costs other than burden costs is the Comparative Cost of Melt Statement shown below.

Burden Statements can be conveniently kept in a linen-back folder in comparative form to run six months. A history of the burden costs of each foreman's department is thus provided which serves as an aid to proper management. Future history can best be controlled if the foreman knows past history.

In conclusion, let it be urged again that every effort be made toward scientific control of burden through the use of departmental rates, burden and expense statements, and adequate accounting methods.

COMPARATIVE COST OF MELT [1]

Month	Metal Poured		Cost of Melt		Cost per Pound	
January, 1919	Month	Total	Month	Total	Month	Av'ge
February						
March						
April						
May						
June						
July						

[1] Form taken from the Standard Cost System of the American Foundrymen's Association.